

INNOVATION AND CREATIVITY ENHANCEMENT (1)

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" Electricity is not only present in a magnificent thunderstorm and dazzling lightning, but also in a lamp; so also, creativity exists not only where it creates great historical works, but also everywhere human imagination combines, changes, and creates anything new."

Innovation and Creativity are fundamental to all academic disciplines and educational activities , not just the arts . Innovation can be broadly thought of as new ideas , new ways of looking things , new methods or products that have value . Innovation contains the idea of output , of actually producing or doing something differently , making something happen or implementing something new . Innovation almost always involves hard work ; persistence and perseverance are necessary as many good ideas never get followed through and developed .

Creativity is an active process necessarily involved in innovation . It is a learning habit that requires skill as well as specific understanding of the contexts in which creativity is being applied . The creative process is at the heart of innovation and often the words are used interchangeably .

According to Kampylis and Berki, **'Creative thinking is defined as the thinking that enables students to apply their imagination to generating ideas, questions and hypotheses, experimenting with the alternatives and to evaluating their own and their peer's ideas , final products and processes' .**

Learning involves challenging, refining , and improving understanding by being made of think hard . Sometimes, to understand new concepts and broaden perspectives, our approaches to thinking need to be creative, imaginative and lateral (incorporating new ways of looking at things), as well as linear (using existing patterns of thought). Our characteristic of the creative process that makes it particularly powerful is that it requires not only knowledge and understanding of the domain being investigated, but also a willingness to question and not be constrained by existing knowledge.

'One cannot think creatively unless one has the knowledge with which to think creatively. Creativity represents a balance between knowledge and freeing oneself of that knowledge.'

There are several traits and learning habits that affect a learner's personal disposition, motivation and confidence to be creative. For example:

- **resilience: an ability to tolerate uncertainty and persevere at a task to overcome obstacles**
- **not being afraid to make and learn from mistakes**
- **an ability to suspend judgement while generating ideas**
- **willingness to take sensible risks or go out of their comfort zone in their work .**

A creative learner needs to be able to develop and apply a set of skills that they can use in the creative process. These include being able to clarify , analyse and re-define the problem or questions to uncover new ways of looking at it , ask thoughtful questions, notice connections between seemingly unrelated subject matter, recognise alternatives possibilities and look at things from different perspectives.

Creative processes usually require self-regulation, and the ideas relating to reflection and metacognition. These include learners being aware of their own skill , both strengths and limitations, thinking of a range of different strategies or approaches to use in response to a problem or question, monitoring their work , and being flexible enough to change to a different approach if necessary .

Creating a culture of Creativity in schools : We all born withe a creative instinct and all people have creative potential. Like a habit , creativity can e encouraged or discouraged . Having a learning rather than a performance orientation, helps to create an environment where creativity is encouraged . Schools that are successful at stimulating creative learning value and celebrate learners' creative and innovative contributions, encourage a broad nd balance curriculum so that students experience a range of subjects and activities, including arts , develop codes of behaviour and classroom procedures that value and promote creative

The creative process requires time and collaboration, so creating time for creative thinking activities is important. Using a flipped classroom approach for example, where learners prepare content and do writing exercise prepared for lessons in advance at home, allows teachers to plan for higher-level creative thinking activities during class time . Creating a climate in the school by providing an environment that supports innovation can be very powerful.

Commom misconceptions about creativity : People sometimes hold tacit beliefs or theories about the nature of creativity which can have detrimental effects on attempts to nurture creativity in an educational context . These theories are different from what research suggets is in fact the case . For example, many people believe that creativity is a natural talent which cannot be taught, whereas studies have shown that learners can improve their creative thinking skills with the right type of input .

Creative teachers :

Teachers can support creativity and innovative by:

- Role modelling creative habits
- Appreciating the critical importance of questions, both their own and those asked by students
- Treating mistakes as learning opportunities and encouraging learners to take sensible risks in the classroom
- Giving learners sufficient time to complete their work
- Scaffolding tasks carefully to provide the appropriate level of challenge .

Mathematics, creativity and innovation :Creativity is what maths is all about... We're coming up with some completely unexpected patterns, either in the reasoning or the results... We're thinking in terms of beauty and creativity, but the outside world thinks of us like a computer.'

That mathematics is still being created often comes as a surprise to most students, and many teachers. Their perception is that mathematics is the one subject in which you know conclusively that you have the right answer. Indeed, many students prefer mathematics over other subjects precisely because of this. The misconception arises because they believe that calculation, and solving routine problems such as those assessed in qualifications, is mathematics. Infact the whole are non-routine, and that of course involves thinking creatively.

Science and Creativity :Science is not only a body of knowledge to be learned and understood, it represents a powerful method in identifying and solving problems bwith a significant creative component. Well-planned, structured enquiry is fundamental to science teaching as it reflects the scientific method: curiosity based on existing knowledge, hypothesis formulation, systematic observation, measurement and experimentation leading to new insights. A deep understanding of the scientific method provides powerful knowledge to students, preparing them for further study in science and helping them to understand applications beyond science.

Arts and Creativity :Arts subjects such as art and design, music, drama and dance are often associated with creativity and innovation. A broad and balanced curriculum recognises that encouraging the Arte can help students to develop their own creative voice and creative thinking skills. Studying an arts subject can also build learners' self-confidence as they feel valued for their unique contributions and talents. When encouraging creativity across the curriculum, it can be useful to look at the ideas and techniques that underpin the teaching of creativity subjects such as art, drama and music .

Assessing Innovation and Creativity :The outcomes of creative processes are Incorporated naturally into teaching and learning. Teachers can assess them when students complete an assignment or task and have demonstrated creativity. Because creativity is a process inherently linked to reflection, it is often valuable to assess progress at appropriate points in the journey. This needs to be done sensitively. If

learners or teachers are too critical of ideas during the ideas generation phase, they may find that they dismiss all their ideas and do not have anything to work with.

Creativity lends itself to self-evaluation, peer evaluation, process/progress learning diaries (sometimes called process or progress journals), portfolio assessments, blogs, presentations and exhibitions. This focuses on the processes involved in creative work, including investigation, skills, discussion, evaluation and reflection.

-by Swati Gupta



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